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November 7, 2013

STEM Advisory Council Broadband Committee
c/o Ms. Amy Kuhlers, Program Manager
Connect Iowa
200 East Grand Avenue
Des Moines, IA 50309

Dear Ms. Kuhlers:

On behalf of myself, I would like to thank the STEM Advisory Council for allowing me to respond to the Committee's request, and to offer input on how satellite broadband can be used to expand Iowa's coverage area, especially in less populated, un-served and underserved areas. But before addressing the Committee's questions, I would like to take a few minutes to introduce myself, provide general information about ViaSat's residential satellite service called Exede Internet, and briefly discuss Connected Nation's recent field test to validate the Exede service platform.

My name is Sean Clarke and I am a strategic management consultant focused on developing rural broadband throughout the Midwest via satellite communications. My background includes 25 years working in the satellite and communications industry with companies that include: DirecTV, DISH Network, Qwest Communications, Primestar, and Tele-Communications, Inc.

ViaSat, Inc. is a publicly traded satellite communications company providing satellite communications to the United States Military and U.S. Government since 1986. ViaSat produces innovative satellite and other digital communication products that enable fast, secure, and efficient communications to any location. ViaSat brings today's new communication applications to people out of reach of terrestrial networks, in residential, commercial, and government sectors, with a variety of networking products and services. In 2011, ViaSat launched the world's most powerful communications satellite covering the United States to provide residential broadband service. In 2012, ViaSat began offering its residential service called Exede Internet to un-served and underserved markets with a reliable, affordable, high-speed Internet service that provides speeds up to 12Mbps.

In an effort to independently validate Exede's performance, speed and reliability, Connected Nation field tested an Exede satellite system in July 2013. Testing was conducted over a 30 day period throughout multiple locations in Iowa and Minnesota and their results were published in a White Paper dated September 2013. I have included a

copy of the report for the Committee members and the viewing public at the end of this document.

I. What barriers or other issues can you identify that may impede the increase of broadband access, adoption and use across the state?

Build out cost and scale has been a barrier for all broadband providers, especially as it relates to providing service in both un-served and underserved areas. As is evidenced in the responses from other participants to the Committee's questions, providing a robust, competitive broadband service requires a tremendous amount of money, time, resources, and population density…with the hope that customers will eventually subscribe to the service long enough to pay back the build out cost and generate a return on the investment for the private enterprise.

Additionally, offering a broadband service that is both reliable and affordable have been the two areas that rank at the top of most customer satisfaction surveys. Offering a terrestrial broadband service in un-served and underserved areas requires cabling and electronics that are principally constructed aerially to reduce build out cost for the limited home density service area. By not placing this equipment underground, and mitigating the weathering effects and nature's elements, reliability is impacted, and maintenance costs can easily escalate when compared to urban/suburban, underground constructed broadband networks.

The barriers mentioned above speak to precisely why satellite communications technology has been developed and deployed…to provide a reliable, cost-effective, and affordable solution to the un-served and underserved areas of Iowa. Instead of requiring multiple permits, requesting legislatures for subsidies, and lengthy build outs for these less populated areas, satellite technology can provide an elegant solution immediately vs. months, or even years from now for the rural population of Iowa.

II. If you had to choose one primary barrier, what would that be?

Availability/Immediacy. Looking back at history, cable television began in the early 70's through terrestrial platforms in urban/suburban areas with little, if any interest towards serving the rural population…but if we take a step back, in the early 90's, along comes a nascent product: Satellite Television, and 20 years later, there are now over 30 million viewers watching television through a satellite dish. In addition, we now have satellite radio with over 30 million listeners, and every new automobile has GPS technology embedded it, which is delivered via a satellite network.

The same chronology can be drawn for broadband. The industry has seen terrestrial providers begin with 56k dial-up; enhance it to 1.5 Mbps, then offer today's broadband services in the urban/suburban markets, while once again neglecting the un-served and

underserved customer. One company's neglect is another's opportunity…these un-served and underserved areas are the primary markets for satellite, and customers in these markets have enjoyed the many benefits of satellite products for years. Satellite broadband is offered today at speeds up to 12Mbps, and is just one more example of how neglected customers experience the same technology found in Iowa's major urban/suburban markets.

As so often is the case, history appears to be repeating itself. Satellite Broadband is the technology that provides the solution for rural America. The early days of satellite-delivered Internet were no different than television; and as the technology has evolved into today's offering, satellite broadband is a legitimate, viable service that needs to be considered by the members of the Committee when looking for solutions for the un-served and underserved markets throughout Iowa.

The cable operators, the phone companies, and the fixed wireless providers appear to have the same approach with offering solutions to un-served and underserved areas…it can be done, but not without investment support from either the local/state/federal entity, or the taxpayer. ViaSat is not asking for assistance because the investment has already been made and the risk accepted. ViaSat constructed the satellite, launched it, assembled a national network of service providers, developed a voice service, and established partnerships with DirecTV and DISH Network to offer bundled services to the un-served and underserved customer.

In addition, ViaSat recently announced construction for a second, next generation satellite that will offer 2x the capacity of its current award-winning satellite. The new satellite will cover North America, Central America, the Caribbean, and sea and air lanes between North America and Europe.

Today, ViaSat is offering its award-winning service with organizations such as the American Red Cross for disaster recovery efforts; JetBlue Airlines is in the process of launching in-flight Internet service to its passengers using ViaSat's service, and United Airlines will be offering a similar service in the near future utilizing ViaSat.

The availability/immediacy may be a barrier for the terrestrial providers, but satellite broadband provides an immediate solution for those neglected in un-served and underserved areas in Iowa…and offering the service requires zero taxpayer assistance. ViaSat is currently adding many customers every day in Iowa, and will continue to do so through its state-wide sales and distribution network.

III. What recommendations do you have to overcome these barriers?

A collective approach with input from stakeholders, private enterprise, and state & local government officials will provide the best solution to eliminating these barriers.

Soliciting a cross-section of service providers and stakeholders should not only provide various options, but also establish a priority for identifying areas that can be addressed in the short-term with today's solutions, but also position the state long-term options as well.

Speaking on behalf of myself and others, the satellite industry wanted to take this opportunity to create awareness for the Committee, and to foster thoughtful, educated discussions why satellite broadband should be considered a legitimate solution for residents of Iowa that have chosen to live in un-served and underserved areas.

Empowering residents in un-served and underserved areas with broadband opens doors and creates opportunities that can be nurtured into tangible economic development. Whether it is offering a rural student access to a distance learning application, providing a small business with Internet access to manage its operations, or eliminating the need for a rural patient to drive long distance for a doctor's visit, these examples can all be accomplished today through satellite technology…and providing this access will not require months of build out or taxpayer assistance; only a two hour window to install the service and empowerment begins with the student, the business, and the patient.

IV. What are your expectations for future access needs?

Consideration. Policy makers need to understand that satellite broadband exists today and can be leveraged when implementing decisions and crafting Broadband Policy. Any discussion regarding future access should include satellite broadband as a viable technology, and how it can be used to augment the state's terrestrial network. Given the rapid improvements in broadband technology, and the challenges with providing it to all population segments, satellite technology offers an efficient, effective solution with no requirement for taxpayer funds; it can be deployed immediately, and is now a leading technology.

V. Other comments?

Once again, I would like to thank the Committee for this opportunity, and hope that the this response provides both an awareness of today's satellite technology, but more importantly offers an education into a viable, immediate solution for Iowa's less populated areas with reliable and affordable broadband Internet.

As mentioned earlier, I have enclosed a copy of Connected Nation's White Paper that discusses its independent testing results for ViaSat's Exede platform, and provides further support as to the service level and its 12Mbps performance.

In addition, the Federal Communications Commission conducted testing this year to measure broadband performance and below is a direct quote from the FCC's results regarding ViaSat's Exede residential service:

"During peak periods, 90 percent of (Exede) consumers received 140 percent or better of the advertised speed of 12 Mbps." -FCC 2013 Measuring Broadband America report.

Regards,

Sean Clarke
Principal
Tri Lakes Consulting

CONNECTED NATION SATELLITE BROADBAND FIELD TESTING REPORT
SEPTEMBER 2013

With equipment spinning thousands of miles above the surface of the earth and covering vast physical land masses, satellite broadband validations have been a bit of a challenge for Connected Nation's Engineering and Technical Services (ETS) team…until now. This white paper discusses some of the challenges of satellite as a broadband platform, a new process developed by the ETS team to validate satellite broadband providers in the field, and results from a validation methodology derived from leveraging CN's broadband inquiry database.

Residential Satellite Broadband Today

Satellite direct-to-home broadband services have experienced numerous improvements in technology and capabilities in recent months. Residential satellite broadband can now deliver multi-megabit speeds and vastly improved performance compared to earlier versions at an affordable price. Satellite broadband is available to virtually every consumer location within the continental United States, as long as a clear view of the southern sky is available.

While WiFi networks utilize certain frequencies to operate at very short distances, satellite broadband uses spectrum licensed by the Federal Communications Commission to transmit at much higher frequencies, able to reach 22,500 miles from the earth's surface. The view of the continental United States is excellent from that distance, and the customer equipment back on Earth is extremely efficient in communicating in a two-way broadband Internet mode with the satellite systems deployed in geo-synchronous orbit in space.

When satellite delivered broadcast *television* services are in use, one is joining in on a broadcast sent to thousands of consumers in a one-way, receive-only mode. With any Internet broadband connection, however, each connection is typically delivered individually to the person making the request, thus requiring *two*-way communication, and sufficient bandwidth to accommodate all of the simultaneous requests. Even though the radio signals are traveling at the speed of light, there is a slight time delay from the moment a person makes a request at home to the time a response is received back from the satellite. This delay is called "latency" and is typically caused by signal processing that occurs within all routers, switches, servers, and transmission equipment.

Latency is present in all broadband services to varying degrees, based upon several factors, but is usually very short – typically 50 milliseconds with terrestrial broadband services such as DSL and cable modem. As a comparison, a human blinks at a speed of about 300-400 milliseconds (ms), so a person would normally not notice terrestrial broadband latency. In satellite broadband systems, however, latency is longer due to the great distance in sending the signals

to and from the earth – in addition to the normal terrestrial latency. A satellite broadband system located 22,500 miles away – nearly the entire distance around Earth's equator – has a typical latency of at least 700 ms, or more than ten times the latency found with terrestrial broadband systems.

In addition to the challenge of high latency, additional problems have historically plagued satellite broadband technology from a marketing perspective. Such problems include expensive equipment costs and service plans, complex installations, and slow broadband service in comparison to other land-based cable, DSL, fixed wireless, and fiber broadband services. This report steers away from the economics and marketing of the service and focuses instead on the validation of the delivery system and its achieving broadband speeds.

How is Satellite Broadband Deployed?

Connected Nation recognizes five satellite providers offering residential broadband service in the nine states and one U.S. territory in which CN currently collects and submits broadband datasets. Although each provider determines its own satellite configuration, this paper will focus on one satellite broadband provider, ViaSat, who operates the Exede satellite delivery system. ViaSat also owns the WildBlue satellite broadband system.

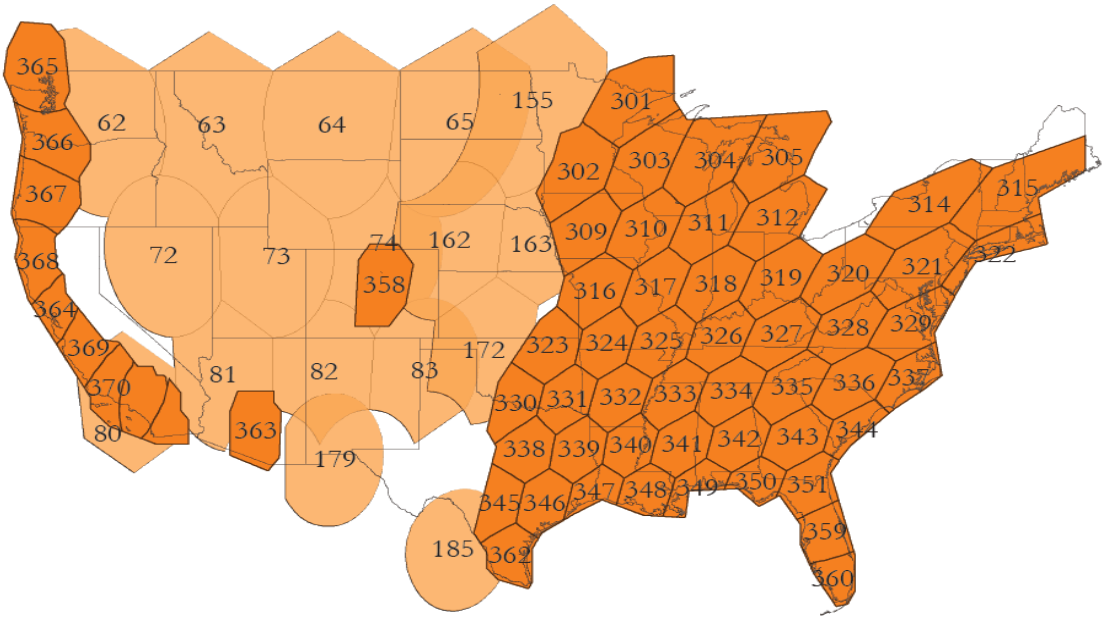
WildBlue service was an early entrant in satellite broadband and was sold across the country to accommodate the demand for rural broadband where other traditional broadband service providers did not, or could not, provide service. As the WildBlue customer base increased, and as Internet applications and bandwidth needs also increased to support a multitude of new "apps," the system became overloaded – just as land-based systems also became overloaded. Early adopters who had purchased their satellite systems with significant individual investment became frustrated with slow and unreliable services, especially as additional new satellite customers came onto the system and compounded the problem.

To resolve the congestion and overload problem created by serving the entire continental United States with a small number of Internet broadband satellite transponders, ViaSat created the Exede delivery system. The deployment of this system required a highly technical and extremely aggressive investment plan based on spot beams covering small geographic areas on Earth – typically 200-300 miles across. Spot beams re-use frequencies in consecutive areas stacked together like a honeycomb. This deployment structure essentially multiplies the available capacity over and over with each additional spot beam deployed. The end result is that the satellite broadband service bandwidth and capacity are greatly improved. ViaSat now claims that the Exede system has enough newly installed spot beam capacity to accommodate an additional 1 million residential users.

Exede's spot beams shadow, rather than replace, WildBlue satellite broadband signals. ViaSat's strategy for the rollout of the Exede spot beams was to first overlay coverage of earlier satellite broadband deployments where the highest density of satellite broadband subscribers already existed. By doing so, the company can minimize overloading the older systems as new

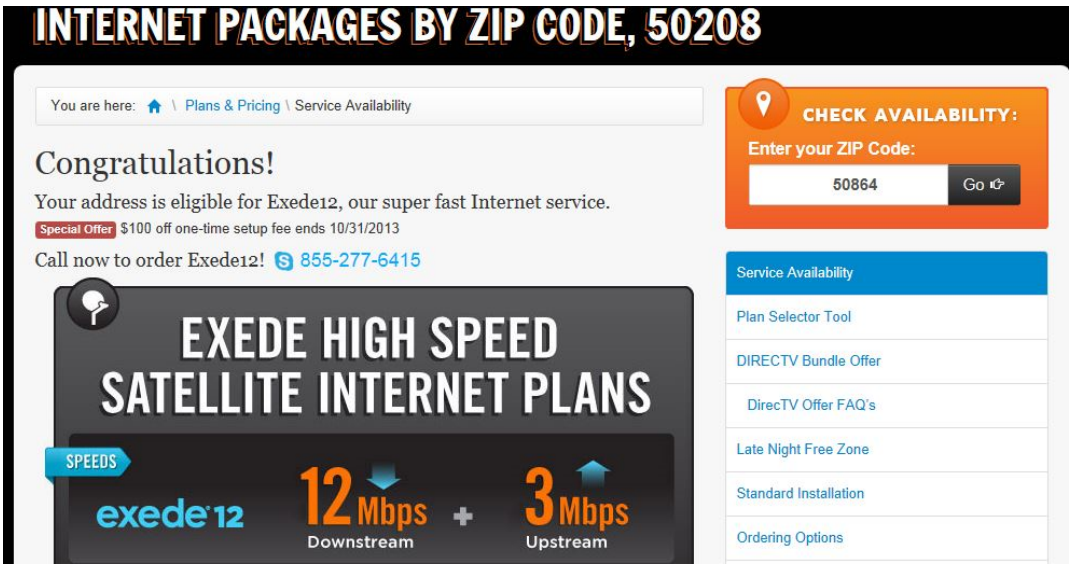
customers come on board. As a result, ViaSat operates WildBlue and Exede services simultaneously with separate speeds and technical platforms. For example, the WildBlue service offers download speeds as high as 5 Mbps, whereas, Exede advertises a 12 Mbps service.

ViaSat's WildBlue Footprint and Exede Spot Beams



White areas have no ViaSat satellite coverage.

Exede's Advertised Broadband Speed



Obtaining residential satellite broadband service is relatively easy and affordable, although early adopters are often chagrined at a second equipment investment required to make use of improved services. For Exede's satellite service, each system is installed and activated by a local, professionally trained dealer within the Exede network. Satellite *television* installers may not be qualified to install satellite broadband due to the more rigorous requirements related to the two-way connection needed for broadband Internet.

Validating Satellite Broadband

Connected Nation's ETS team has two main objectives in validating a provider's broadband service: 1) confirm the provider's presence in the target testing area, and 2) confirm that the provider's Internet service meets or exceeds the required minimum broadband speed. To confirm a provider's presence, a CN technician would visit, inspect, and document (often with pictures) provider office locations, broadband equipment in the field, billboards, and other local advertising, and detected WiFi networks. For mobile and fixed wireless networks, a technician can often perform signal tests for known frequencies licensed to and/or used only by that provider. If an Internet connection is found and accessed in the field, the detected provider's service could also be tested using a speed-test utility.

Over the past three years, attempts to use any of these techniques for satellite validation proved futile as the basic tools for validating other platforms do not exist for satellite. For example, residential satellite equipment for broadband is difficult to distinguish from satellite video gear as viewed from the street. Further, a satellite installer can serve several counties, and may not have a retail presence. As a result, confirming the presence of a specific satellite provider in any targeted community has been challenging. In trying to confirm broadband speeds, historically slow speeds and high latency on the satellite services have also prevented this level of validation.

The CN ETS team recently devised an approach to confirm both presence and speed by deepening the desktop research in advance of field validation, accessing controlled use of satellite testing equipment, and leveraging CN's rich database of broadband inquiries. Using Exede as a participating test subject and model for satellite broadband validation, an ETS technical engineer fine-tuned the process in Iowa and Minnesota as described below.

The first objective was to confirm that Exede service was available throughout a targeted service area. In addition to using the Exede coverage map above, the engineer used Exede's website to look at each individual county within Iowa to find all Exede dealers, installation companies, and storefronts. Using this tool, he located 28 authorized dealers serving 98 of Iowa's 99 counties. Many dealers are actually electric or telephone cooperatives such as the rural Exede dealer and electric co-op in Jackson, Minnesota, shown below. In identifying these dealers, CN confirmed the provider's presence virtually throughout the state.

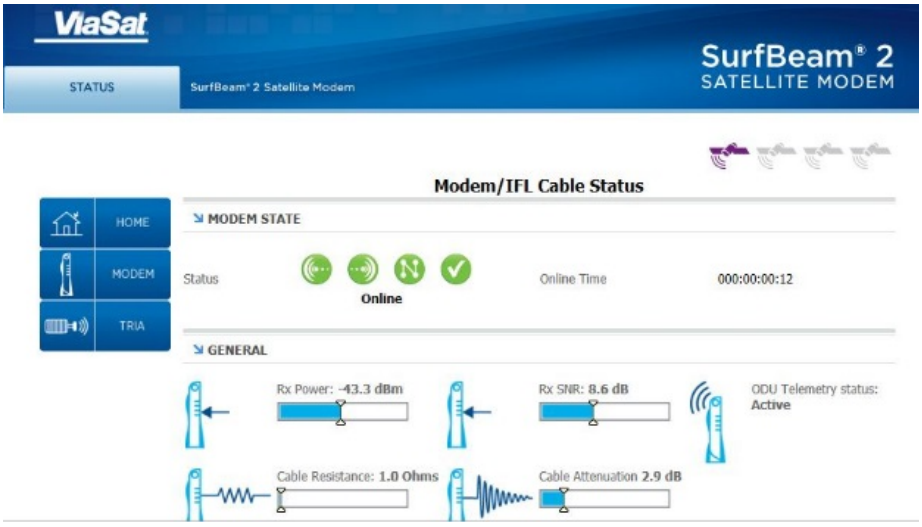
Exede Authorized Dealer – Federated Rural Electric Association in Jackson, MN

The next step was to identify specific provider equipment at various locations. Since satellite broadband equipment is difficult to distinguish from satellite television equipment, CN teamed with an Iowa Exede representative to obtain the use of Exede equipment for 30 days. The testing began at a *fixed* location chosen by CN – the Worthington Bio-Technology Advancement Center in Worthington, Minnesota. The center's manager agreed to allow CN to use the Worthington facility to test the satellite service to help promote satellite broadband technology for rural residential and educational purposes.

Exede Installation and Test Site in Worthington, MN

The Exede system was installed and demonstrated by Sean Clarke, of Tri-Lakes Consulting. The broadband equipment was set up on a temporary ground-mount in front of the center with a cable extending to the building and then inside to a modem and computer. The equipment assembly was straightforward, and only one RG-6 cable was necessary for the installation (previous versions required two cables, making installation and troubleshooting more difficult). The azimuth and elevation presets arrive with the system for the specific zip code where the system is to be installed, which shortens the field installation time for the trained technician. The satellite dish was coarse-tuned, and the modem equipment was connected. After the dish was fine-tuned, the installer established an Internet connection, and performed an automatic firmware and software download with the latest versions of Exede's operating requirements. Once the download was complete (a few minutes), the system was engaged and ready for use.

Exede's Internet Connection GUI



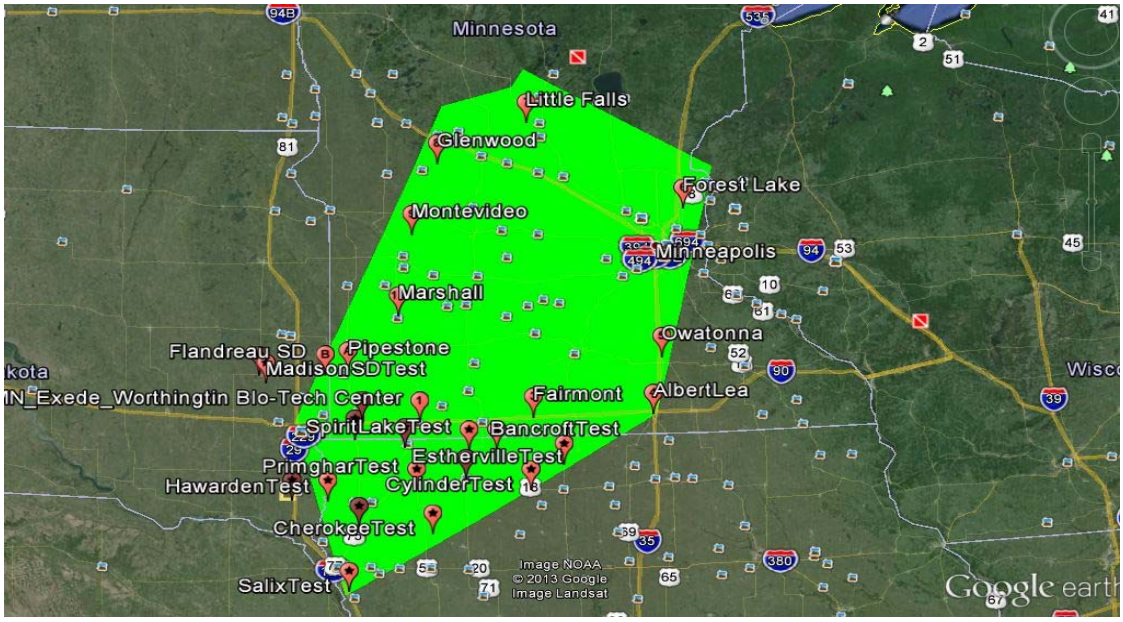
Exede's satellite broadband service consistently delivered the advertised speed of 12 Mbps, and many tests performed well beyond the advertised speed. Internet applications worked well, and download tests consistently delivered multi-megabit packages. Streaming video worked well with no buffering, and upstream speed tests were smooth and consistent. **As a result of this supervised testing, CN was able to confirm both the presence of the satellite provider in a targeted area, and that the provider delivered broadband-defined speeds within the area.**

Field Validation Testing

For testing Exede's satellite broadband service in multiple residential areas, the engineer selected Exede's Spot Beam 302 and tested in a variety of locations. The targeted spot beam coverage includes a large portion of southwestern Minnesota, as well as a portion of northwestern Iowa. He was able to secure the Exede receiver system on a hitch mount on the

back of a vehicle, and connected the system to a portable power inverter and laptop. To test the system at numerous locations within the boundary of the advertised spot beam, the system was re-tuned at each testing location using the Worthington set-up parameters as a reference. Numerous tests were conducted at the edge of the spot beam to determine if the signal degraded at the spot beam's defined boundaries. In fact, once the system was locked in place as described below, the system performed equally well at the edge of, or even slightly out of, the beam as it did in the center of the beam.

Satellite Broadband Speed Test Locations within Exede's Spot Beam 302



Testing began in the Minnesota portion of the spot beam as shown with the location markers in the map above. A week later, beam testing and performance testing took place in a similar format within Iowa utilizing the same Exede equipment. Although there were no extreme or heavy weather conditions during the testing process, temperatures were typically hot and humid, with some days of overcast conditions. Testing was performed at various times of day (**Exhibit 1**).

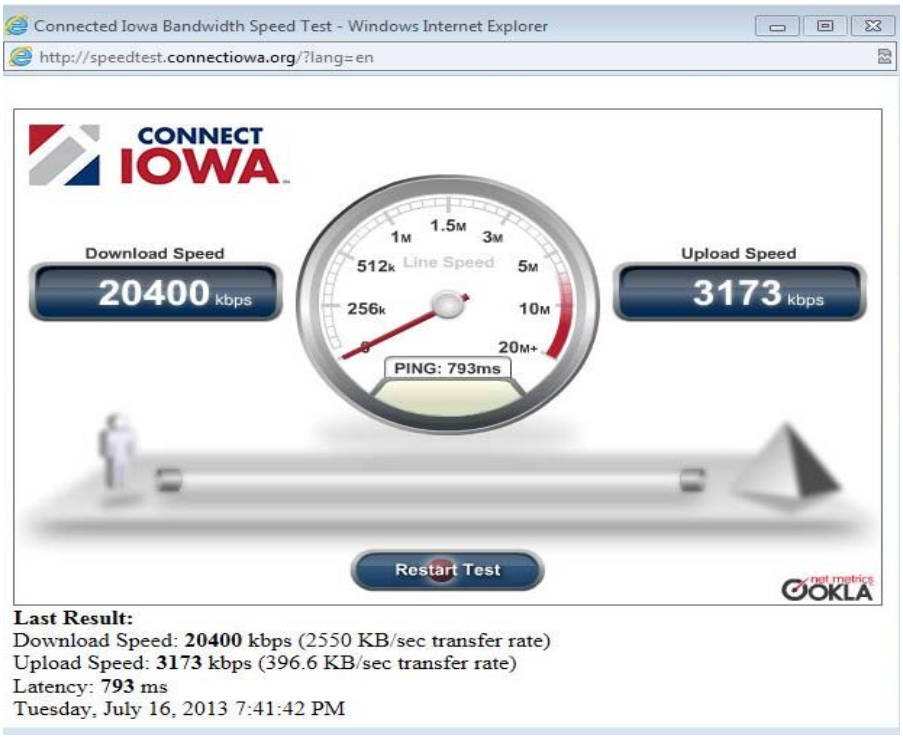
Testing the Exede system required a clear view of the southern sky. After stopping at a suitable location, the engineer would level the satellite receiver equipment and coarse-tune the low-noise block (LNB) transverter arm of the satellite dish; the LNB collects the radio waves sent to the dish from the satellite, and prepares it for transmission through the cabling to the modem and computer. The equipment would then be oriented south, and elevated to a reasonable inclination for set-up. Orientation would be fine-tuned and completed using a PC-aided installation set-up procedure, and the settings would be locked for use.

Installation and Testing Parameters

Installer ID	
Provisioned Beam	302
Provisioned Satellite	ViaSat-1
Desired Satellite	ViaSat-1
Azimuth	204.3°
Elevation	36.0°
Skew	70.8°
Boom Arm Angle	16.6°
APA/Modem Key	NWXF-P5PR-5DJF-KRC5
Equipment	SB2
Polarization	Right
Latitude	43.6401°
Longitude	-95.5915°

Using the modem and laptop configuration, signal strengths were recorded and speed tests were performed and documented (**Exhibit 2**) using both Connect Minnesota and Connect Iowa websites. As a secondary reference, speed tests were also recorded and documented using the SpeakEasy.net speed test using Chicago, Illinois as the common speed test gateway location. Exede speed test results typically exceeded the advertised 12 Mbps download speed.

Sample Speed Test Results from Exede Test in Bancroft, IA



Just as the presence and speed of the Exede satellite broadband system was confirmed at the fixed location in Worthington, Minnesota and similar to processes followed for other broadband providers and platforms, this new testing process developed by the ETS team successfully validated the Exede broadband service throughout the targeted test areas in Minnesota and Iowa.

In Minnesota and Iowa, the technical engineer successfully utilized satellite equipment to perform speed tests in the field and confirmed ViaSat as a viable broadband provider through its Exede satellite service. Fortunately for this single service provider in these two states, the engineer was able to secure the temporary use of broadband equipment. For those states in which satellite equipment may *not* be available for portable testing, however, the ETS team devised an alternate approach to testing and validating satellite broadband service.

Broadband Inquiries

Connected Nation has received thousands of inquiries from consumers seeking broadband service alternatives. Scores of those inquiries come from consumers currently accessing the Internet at home with satellite service. By enlisting the help of those consumers to test their satellite service through the CN state websites, the ETS team created a process to both verify the presence of specific providers at specific locations (the consumers' addresses), and obtain speed test results for validating broadband speeds.

To test the process, a second CN technical engineer identified all broadband inquiries received in the state of South Carolina in which the consumer identified himself or herself as a satellite customer. An e-mail was sent to all relevant consumers requesting that they visit the Connect South Carolina website and perform a speed test using their home satellite service. By placing a deadline of 24 hours in which to perform the test, he was able to obtain the test results for the website during that test period, cross-check the noted names and addresses on the tests against the inquiry list, and filter out all other tests unrelated to satellite service.

In South Carolina, the results were both substantial and informative. On a selected Thursday, this second engineer sent speed test requests to 20 e-mail addresses. Within the noted 24 hours, information was received from 9 of those addresses (45%). Of those 9, 5 performed speed tests (20% test rate). Both HughesNet and ViaSat were able to be validated in South Carolina as a result of the tests (below).

South Carolina Speed Tests Performed by Satellite Internet Consumers

Provider	Test Site Info							Speed Test Data					
Provider	Test City	Test State	Test County	Physical Address	Latitutde	Longitude	Presence Confirmed	Utility	Time	Ping Time (ms)	Download Speed (kbps)	Upload Speed (kbps)	Min Speed Met?
Hughes Network Systems, LLC	Pauline	SC	Spartanburg	Old Hills Bridge Rd	34.74	-81.88	Yes	connectsc.org	5:16 PM	861	4870	308	Yes
Hughes Network Systems, LLC	Westminster	SC	Oconee	Tallulah Dr	34.57	-83.09	Yes	connectsc.org	9:00 PM	1146	571	133	No
Hughes Network Systems, LLC	Ridgeville	SC	Dorchester	Myers Mayo Rd	33.10	-80.27	Yes	connectsc.org	10:37 PM	836	1248	190	Yes
ViaSat Communications, Inc.	Edgefield	SC	Edgefield	Abel Drive	33.70	-82.08	Yes	connectsc.org	9:14 PM	867	7039	1470	Yes
Hughes Network Systems, LLC	Prosperity	SC	Saluda	Denny Highway	34.13	-84.54	Yes	connectsc.org	10:39 PM	645	9142	615	Yes

The original technical engineer also performed a similar process in Iowa. Within 24 hours of his request, he received information from 13 of 32 addressed consumers. Ten e-mails were returned indicating that the consumers switched away from satellite service. Of the remaining 3, 2 responded stating that they were no longer satellite users in the state, and the last actually performed a speed test.

Although the response rate from South Carolina satellite users was higher than in Iowa, **in both states, CN can count at least one satellite validation with confirmation of the provider's location and speed**.

Conclusion

For many rural consumers, satellite service is the only platform available for accessing the Internet, other than dial-up telephone. Historically, satellite broadband has been expensive and slow, and much of the blame has been placed on the simple physics of transmitting wireless data traffic nearly the distance of Earth's circumference – twice for each mouse click. This extreme distance, relative to other broadband alternatives, results in noticeable delay – or latency – in broadband performance that can be more than 10 times greater than that experienced using other terrestrial broadband platforms.

For Connected Nation's ETS team, the challenges of both distance and latency had been significant obstacles to validating satellite broadband providers. Two new processes, however,

have been developed and tested to meet that challenge. One process uses standard satellite equipment rigged to a portable carrier to test speeds throughout targeted areas, and the second process leverages CN's broadband inquiry database to enlist consumers to perform speed tests that can be analyzed.

Using ViaSat's Exede satellite network as a test subject, the CN technical engineer performed speed tests at a fixed location as a base case, and then devised a method to carry the satellite equipment to various remote locations, fine-tune the equipment to lock in the two-way satellite signal at each location, perform speed tests over Exede's satellite service, and capture the results of those tests. In CN's field testing, consistent downstream and upstream speeds were experienced at the locations tested – even at the edges of the spot-beam.

For those states in which satellite equipment may *not* be available for portable testing, the ETS team successfully tested a validation process by requesting, capturing, and filtering test results using CN's database of broadband inquiries, many of which originated from satellite broadband users who responded to our email requests for assistance.

With these two new processes, and with the help of both satellite providers and satellite users, Connected Nation's ETS team now can perform reliable testing for satellite validations.

Exhibit 1
Speed Test Results by Time of Day

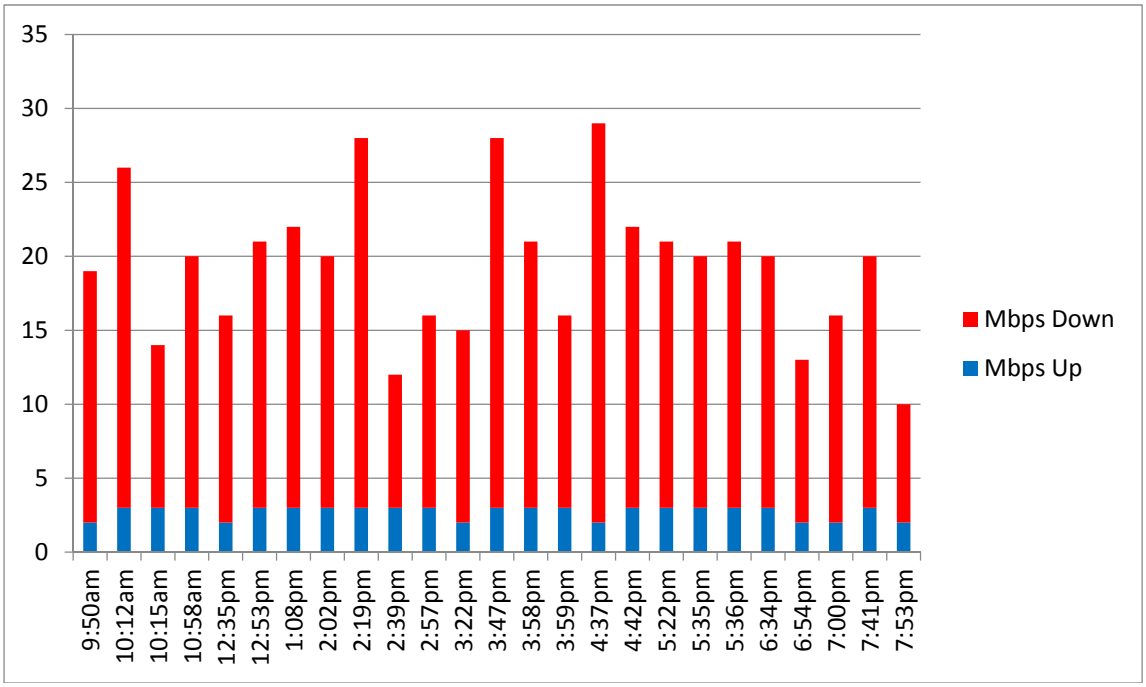


Exhibit 2
Exede Field Test Speed and Latency Results from Iowa/Minnesota Beam 302

Location	Date	Time	Zip Code	Exede Advertised Speeds DS/US	Connect IA/ MN.orgSpeedtest Actual Tested DS/US	Speakeasy.net Speedtest Actual Tested DS/US	Exede Advertised Latency	Connect IA/ MN.org Actual Tested Latency	Speakeasy.net Actual Tested Latency	Jitter
Worthington, MN	07-08-13	3:22pm	56187	12Mbps/3Mbps	15.048Mbps/2.361Mbps	11.72Mbps/2.50Mbps	700 milliseconds	901 ms	N/A	N/A
Luverne, MN	07-10-13	10:12am	56165	12Mbps/3Mbps	26.40Mbps/2.98Mbps	11.64Mbps/2.58Mbps	700 milliseconds	853 ms	691 ms	12 ms
Fairmont, MN	07-10-13	12:35pm	56031	12Mbps/3Mbps	15.80Mbps/2.47Mbps	9.2Mbps/2.01Mbps	700 milliseconds	857 ms	677 ms	14 ms
Albert Lea, MN	07-10-13	2:19pm	56007	12Mbps/3Mbps	28.14Mbps/3.04Mbps	9.19Mbps/2.23Mbps	700 milliseconds	858 ms	691 ms	15 ms
Owatonna, MN	07-10-13	3:59pm	55060	12Mbps/3Mbps	16.39Mbps/2.62Mbps	22.63Mbps/2.81Mbps	700 milliseconds	911 ms	715 ms	25 ms
Forest Lake, MN	07-10-13	6:54pm	55013	12Mbps/3Mbps	12.75Mbps/2.11Mbps	11.47Mbps/2.54Mbps	700 milliseconds	860 ms	683 ms	17 ms
Little Falls, MN	07-11-13	9:50am	56345	12Mbps/3Mbps	19.13Mbps/2.09Mbps	10.52Mbps/2.02Mbps	700 milliseconds	936 ms	705 ms	19 ms
Montevideo, MN	07-11-13	3:58pm	56265	12Mbps/3Mbps	21.032Mbps/2.661Mbps	22.46Mbps/3.52Mbps	700 milliseconds	901 ms	667 ms	10 ms
Marshall, MN	07-11-13	5:36pm	56258	12Mbps/3Mbps	20.506Mbps/2.777Mbps	11.95Mbps/2.11Mbps	700 milliseconds	842 ms	666 ms	09 ms
Pipestone, MN	07-11-13	7:00pm	56164	12Mbps/3Mbps	15.665Mbps/2.367Mbps	11.27Mbps/2.53Mbps	700 milliseconds	889 ms	679 ms	10 ms
Flandreau, SD	07-11-13	7:53pm	57028	12Mbps/3Mbps	10.361Mbps/1.881Mbps	9.21Mbps/2.2Mbps	700 milliseconds	921 ms	679 ms	12 ms
Steen, MN	07-16-13	10:58am	56173	12Mbps/3Mbps	20.249Mbps/3.081Mbps	12.41Mbps/2.48Mbps	700 milliseconds	786 ms	672 ms	11 ms
Sibley, IA	07-16-13	12:53pm	51249	12Mbps/3Mbps	21.205Mbps/3.183Mbps	11.21Mbps/2.66Mbps	700 milliseconds	798 ms	679 ms	18 ms
Primghar, IA	07-16-13	2:02pm	51245	12Mbps/3Mbps	19.722Mbps/3.122Mbps	11.00Mbps/2.44Mbps	700 milliseconds	792 ms	695 ms	16 ms
Spencer, IA	07-16-13	2:57pm	51301	12Mbps/3Mbps	16.045Mbps/2.982Mbps	10.17Mbps/2.43Mbps	700 milliseconds	751 ms	653 ms	14ms
Spirit Lake, IA	07-16-13	3:47pm	51360	12Mbps/3Mbps	27.951Mbps/3.017Mbps	09.42Mbps/1.95Mbps	700 milliseconds	799 ms	688 ms	16 ms
Estherville, IA	07-16-13	5:22pm	51334	12Mbps/3Mbps	20.940Mbps/3.111Mbps	10.49Mbps/2.16Mbps	700 milliseconds	789 ms	691 ms	20 ms
Cylinder, IA	07-16-13	6:34pm	50528	12Mbps/3Mbps	20.496Mbps/3.259Mbps	12.3Mbps/2.64Mbps	700 milliseconds	769 ms	663 ms	13 ms
Bancroft, IA	07-16-13	7:41pm	50517	12Mbps/3Mbps	20.400Mbps/3.173Mbps	11.28Mbps/2.5Mbps	700 milliseconds	793 ms	687 ms	16 ms
Cherokee, IA	07-17-13	10:15am	51012	12Mbps/3Mbps	15.492Mbps/2.881Mbps	10.92Mbps/2.44Mbps	700 milliseconds	790 ms	678 ms	09 ms
Salix, IA	07-17-13	1:08pm	51052	12Mbps/3Mbps	22.036Mbps/3.142Mbps	11.77Mbps/2.71Mbps	700 milliseconds	762 ms	657 ms	20 ms
LeMars, IA	07-17-13	2:39pm	51031	12Mbps/3Mbps	12.433Mbps/2.565Mbps	11.27Mbps/2.48Mbps	700 milliseconds	739 ms	679 ms	05 ms
Hawarden, IA	07-17-13	4:37pm	51023	12Mbps/3Mbps	28.594Mbps/2.081Mbps	10.05Mbps/1.95Mbps	700 milliseconds	789 ms	680 ms	05 ms
Beresford, SD	07-17-13	5:35pm	57004	12Mbps/3Mbps	20.139Mbps/3.058Mbps	12.03Mbps/2.63Mbps	700 milliseconds	781 ms	692 ms	16 ms
Madison, SD	07-19-13	4:42pm	57042	12Mbps/3Mbps	22.003Mbps/3.197Mbps	8.17 Mbps/2.08Mbps	700 milliseconds	775 ms	671 ms	07 ms

Note: Connect Iowa and Connect Minnesota speed tests utilize OOKLA Speed Test Services.